



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,220	02/03/2006	Bernard Jacob Andries Stommen	NL030986	9547
24737	7590	12/28/2007	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS			BARNES, CRYSTAL J	
P.O. BOX 3001			ART UNIT	PAPER NUMBER
BRIARCLIFF MANOR, NY 10510			2121	
MAIL DATE		DELIVERY MODE		
12/28/2007		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/567,220	STOMMEN ET AL.
Examiner	Art Unit	
Crystal J. Barnes	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Statyus

1) Responsive to communication(s) filed on 03 February 2006.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-23 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) Claim(s) _____ is/are allowed.
6) Claim(s) 1-6, 10-15 and 19-21 is/are rejected.
7) Claim(s) 7-9, 16-18, 22 and 23 is/are objected to.
8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 03 February 2006 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948) Paper No(s)/Mail Date. ____ .
3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ . 5) Notice of Informal Patent Application
6) Other: ____ .

DETAILED ACTION

1. The following is an initial Office Action upon examination of the above-identified application on the merits. Claims 1-23 are pending in this application.

Priority

2. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has complied with the conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 365(c).

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

4. The disclosure is objected to because of the following informalities:

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the section heading should be omitted:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claim 1, the phrase "especially for" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

8. Regarding claim 1, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 6, 10, 15, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,844,666 to Van Engelen et al.

As per claim 1, the Van Engelen et al. reference discloses positioning apparatus, especially for measuring machines, manufacturing machines or the like, comprising at least one position sensor (12) (see column 12 lines 44-50, "laser interferometer"), at least one position controller (13) ("position control system") and at least one position actuator (14) ("linear motor 69"), wherein the or each position sensor (12) ("laser interferometer") measures the position of a position-controlled device (11) ("mask holder 5"), wherein the or each position controller (13) ("position control system") uses measurement signals provided by the or each position sensor (12) ("laser interferometer") as input signals, and wherein output signals generated by the or each position controller (13) ("position control system") are used by the or each position actuator (14) ("linear motor 69") to control the position of said position-controlled device (11) ("mask holder 5"), the positioning apparatus ("positioning device") further comprising gravity compensation means compensating gravitational forces (see column 17 lines 20-21, "force actuator

system") acting on said position-controlled device (11) ("substrate holder 1, mask holder 5"), characterized in that the gravity compensation means ("force actuator system") comprises at least one gravity compensation controller (16; 25, 28) (see column 17 lines 53-59, "electric controller") and at least one gravity compensation actuator (17) ("force actuators 205"), wherein the or each gravity compensation controller (16; 25) ("electric controller") uses the output signals generated by the or each position controller (13) ("position control system") as input signals, thereby generating output signals ("Lorentz forces") used by the or each gravity compensation actuator (17) ("force actuators 205") to compensate gravitational forces ("force of gravity") acting on said position-controlled device (11) ("mask holder 5").

As per claim 6, the Van Engelen et al. reference discloses the gravity compensation means ("force actuator system") comprise one gravity compensation controller (16) ("electric controller"), wherein the output signals ("Lorentz forces") of said one gravity compensation controller ("electric controller") are used to control the gravity compensation actuator (17) ("force actuators 205").

As per claim 10, the Van Engelen et al. reference discloses gravity compensation device for compensating gravitational forces acting on a position-

controlled device (11), wherein the position of said position-controlled device (11) (see column 12 lines 44-50, "substrate holder 1, mask holder 5") is measured by at least one position sensor (12) ("laser interferometer") and controlled by at least one position controller (13) ("position control system"), characterized by at least one gravity compensation controller (16; 25, 28) (see column 17 lines 53-59, "electric controller") and at least one gravity compensation actuator (17) ("force actuators 205"), wherein the or each gravity compensation controller (16; 25) ("electric controller") uses the output signals generated by the or each position controller (13) ("position control system") as input signals, thereby generating output signals ("Lorentz forces") used by the or each gravity compensation actuator (17) ("force actuators 205") to compensate gravitational forces ("force of gravity") acting on said position-controlled device (11) ("substrate holder 1, mask holder 5").

As per claim 15, the rejection of claim 2 is incorporated and further claim 15 contains limitations recited in claim 2; therefore claim 15 is rejected under the same rationale as claim 2.

As per claim 19, the Van Engelen et al. reference discloses method for compensating gravitational forces acting on a position-controlled device, whereby

the position of said position-controlled device (see column 12 lines 44-50, "substrate holder 1, mask holder 5") is measured by at least one position sensor ("laser interferometer") and controlled by at least one position controller ("position control system"), characterized in that at least one gravity compensation controller (see column 17 lines 53-59, "electric controller") uses output signals generated by the or each position controller ("position control system") as input signals thereby generating output signals ("Lorentz forces") used by at least one gravity compensation actuator ("force actuators 205") to compensate gravitational forces ("force of gravity") acting on said position-controlled device ("substrate holder 1, mask holder 5").

As per claim 21, the rejection of claim 2 is incorporated and further claim 21 contains limitations recited in claim 2; therefore claim 21 is rejected under the same rationale as claim 2.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to

be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 2-5, 11-14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,844,666 to Van Engelen et al. in view of USPN 4,964,221 to Breyer et al.

As per claim 2, the Van Engelen et al. reference does not expressly disclose the gravity compensation actuator (17) comprises spring means (18), string means (19), pulley means (20) and motor means (21).

The Breyer et al. reference discloses (see column 3 lines 43-66, "Spindle 9 is gravitationally suspended from a belt 21 which rides two guide pulleys (19, 20) that are mounted to an upstanding support 18 on the top side of the Z-axis guide. The other end of belt 21 is anchored to a pedestal 24, after coursing a fixedly mounted drive pulley 22 and a displaceable pulley 23; pulley 23 is carried at the otherwise free end of a tie-rod 25 which extends through the spring 31 which is used to compensate for the weight of spindle 9. Spring 31 is compressed between a pressure plate 28 fixed to tie-rod 25 and a bracket formation 35 at one end of a spring cage 32 which is mounted to a horizontal support plate 34; plate 34 is secured to guide 8 and is movable

therewith in the Y-direction. The pressure plate 28 is shown as a bracket having means 29 of piloted guidance along a guide rail 30, which may be part of cage 32; and means 26 provides similarly piloted rail guidance of a clevis bracket, by which the displaceable pulley 23 is connected to tie-rod 25. Finally, the drive unit is shown to be mounted to the support plate 34 and to comprise an electric motor 17 and a reduction-gear or angle-transmission unit 15; a belt 16 connects motor output to the input shaft of the transmission 15, and drive pulley 22 delivers output torque to the spindle-suspension belt 21.")

(see column 4 lines 30-43, "As can be seen from like force (F) vs. displacement (a) diagrams in FIGS. 4a and 4c, and with spring tension (FIG. 4a) or spring compression (FIG. 4c) preset to counterbalance the gravitational load of spindle 9 and its probe 10 when in the mid-position of the working range a, the maximum force change from the preset force value is .DELTA.F, for all Z-axis displacements in the working range; this is true whether the spring is prestressed in tension or in compression. And as long as these force changes .DELTA.F can be realized by the drive system 17, 16, 15 to belt 21, via the block-and-tackle connection 23, 24 to spring 31, there is no need to resort to additional measures, to compensate for force changes of magnitude up to .DELTA.F.")

(see column 4 lines 53-66, "Such a position-control circuit is schematically shown in FIG. 6, wherein the transmission connection between motor 17 and spindle 9 is designated 41. A Z-axis position-measuring system consists of an elongate scale 36 on the spindle itself and a photo-electric scale-reading head 37 in the vertical guide means 8. Its position signals are fed, on the one hand, to the control computer 38 of the coordinate-measuring instrument and, on the other hand, to control electronics 35 for motor 17. The position-control circuit is thus a closed loop, supplying motor 17 continuously with current of magnitude and polarity as required to supply residual forces, i.e., differences between the gravitational weight of the spindle 9 and the preload force of spring 31.")

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the positioning device taught by the Van Engelen et al. reference with the device to compensate for the weight as taught by the Breyer et al. reference.

One of ordinary skill in the art would have been motivated to modify the positioning device with the device to compensate for the weight to compensate for force changes by the drive system to the belt to the spring.

As per claim 3, the Breyer et al. reference discloses the spring means (18) (see column 3 lines 50-55, "spring 31") is attached with a first end preferably to the position-controlled device (11) ("spindle 9") and with a second end to the string means (19) ("belt 21").

As per claim 4, the Breyer et al. reference discloses the string means (19) ("belt 21") is wound around the pulley means (20) (see column 3 lines 43-51, "pulley 19, 20; drive pulley 22, displaceable pulley 23"), wherein the pulley means (20) ("pulley 19, 20; drive pulley 22, displaceable pulley 23") is driven by the motor means (21) (see column 3 lines 61-66, "electric motor 17"), and wherein the motor means (21) ("electric motor 17") is controlled by the output signals generated by the gravity compensation controller (25; 28).

As per claim 5, the Breyer et al. reference discloses the pulley means (20) ("pulley 19, 20; drive pulley 22, displaceable pulley 23") is driven by the motor means (21) ("electric motor 17") in a way that the tension (see column 4 lines 30-38, "tension") in the spring means (18) ("spring 31") is kept constant and equal to the gravitational forces ("gravitational load") acting on said position-controlled device (11) ("spindle 9").

As per claim 11, the rejection of claim 2 is incorporated and further claim 11 contains limitations recited in claim 2; therefore claim 11 is rejected under the same rationale as claim 2.

As per claim 12, the rejection of claim 3 is incorporated and further claim 12 contains limitations recited in claim 3; therefore claim 12 is rejected under the same rationale as claim 3.

As per claim 13, the rejection of claim 4 is incorporated and further claim 13 contains limitations recited in claim 4; therefore claim 13 is rejected under the same rationale as claim 4.

As per claim 14, the rejection of claim 5 is incorporated and further claim 14 contains limitations recited in claim 5; therefore claim 14 is rejected under the same rationale as claim 5.

As per claim 20, the rejections of claims 2-5 are incorporated and further claim 20 contains limitations recited in claims 2-5; therefore claim 20 is rejected under the same rationale as claims 2-5.

Allowable Subject Matter

13. Claims 7-9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14. Claims 16-18, 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to positioning control systems compensating gravity forces in general:

USPN 6,872,958 B2 to Andeen et al.

USPN 6,788,386 B2 to Cox et al.

USPN 6,012,216 to Esteves et al.

USPN 6,008,882 to Ito et al.

USPN 5,844,664 to Van Kimmenade et al.

USPN 5,812,420 to Takahashi

USPN 5,425,237 to Suer

USPN 5,138,800 to Janusz

USPN 5,040,613 to Dodd et al.

USPN 4,591,772 to Hollow

JPPN 63-243544 A to KONDO et al.

JPPN 63-168709 A to YOSHIZOE

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Crystal J. Barnes whose telephone number is 571.272.3679. The examiner can normally be reached on Monday-Friday alternate Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Vincent can be reached on 571.272.3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:
10/567,220
Art Unit: 2121

Page 16

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Crystal J. Barnes - Bullock
CRYSTAL J. BARNES
PRIMARY PATENT EXAMINER
CJB

16 December 2007